

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

INJECTION TREATMENT OF VARICOSE VEINS—SOME DETAILS IN TECHNIQUE

K. E. KRETZSCHMAR AND JOHN B. CLARK, LOS ANGELES.—Ordinarily the patient is placed in a sitting position, with the legs supported on a small stool which is of the same height as the patient's chair. With the leg in the horizontal position, we select several points along the vein, about two or three inches apart, and, cleansing the areas with a small alcohol sponge, the needle is then introduced into the vein. Before injecting, it is important to draw blood into the syringe so that one is absolutely certain that the needle is within the lumen of the vein. This precaution will prevent sloughing. Following the injection, the alcohol sponge is again placed over the puncture site and held with some pressure for several minutes until there is no further bleeding. If the bleeding is persistent, collodion or a small gauze dressing is applied at the puncture site.

In some cases it may be better to have the patient stand in order to make the veins more prominent, and the injection is then made with the leg in a vertical position. In those larger veins which seem resistant to the usual methods, we employ a tourniquet above and below the puncture site and allow the tourniquet to remain in place from fifteen to twenty minutes following the injection. Some operators strip the vein before injecting in order to concentrate the solution within the vein, but we believe that this procedure should only be used in cases which resist the usual treatment.

The choice of injection fluids depends upon the nature of the vein to be injected. For most cases we have found that sodium salicylate from 20 to 40 per cent gives the best results. We also employ sodium chlorid from 15 to 20 per cent, especially for the larger veins, but we strongly advise against its use in the more superficial varicosities, as this solution seems to have considerable penetrating power. We find that bichlorid of mercury from .3 to .5 per cent is a very excellent reagent, especially for the more superficial varicose veins, but this solution should never be employed in cases where kidney or bladder trouble exists, and not more than two cubic centimeters or one injection should be given at one sitting.

Some writers advise against injecting the thin, blue superficial veins, whose removal is desired purely for cosmetic reasons. It is true that the injection of these veins requires very careful technique, but we have found that, by introducing the needle laterally through the healthy skin and pointing it forward below the vein, it is possible to enter the vein through the posterior wall. This method has yielded very excellent results. We

feel it is justifiable in certain cases to obliterate the small branchlike venules, which we sometimes find in connection with varicose veins, and for such cases we employ the 60 per cent invert sugar solution or the sublimate solution.

One point which has not been mentioned by other authors is the precaution which should be observed in making injections in the ankle region. Because of the nerves which emerge near the interior and exterior malleoli, one should avoid making injections in this region. Violent ascending pains may be caused during the injections and a more or less chronic neuritis may be induced if this region is not avoided.

During the course of the treatments, when the leg becomes painful and swollen, due to the chemically induced "venitis," we advise the use of cold, moist compresses. This measure seems to give more relief than anything else. Ice-bags should be avoided. Our experience is based on more than 3500 cases with over 120,000 injections.

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J. H. WOOLSEY AND R. J. MILLZNER, SAN FRANCISCO.—"Is it safe?" is the first thought one has regarding the treatment of varicose veins by chemical obliteration. Why do we not have embolic phenomena occur? Sicard, Forestier, and others have mentioned the tortuosity of the vein as the important factor in not allowing the thrombus to break away. In our opinion, the chief factors are direction of the current away from the heart and the rapid and firm organization of the thrombus and its wide attachment to the vein wall. Proof for the latter statement was obtained by our good fortune to secure specimens of veins chemically obliterated over periods from fifteen minutes up to sixty days.

As to technique, the main concern is that the chemical solution is injected intravenously and that it remains there. This means preferably a small needle (No. 26 gauge); that the blood be withdrawn at the start and, if in doubt, during the injection; and that pressure be made over the site of puncture postinjection for five to ten minutes so as to prevent leakage. Since the flow of blood in a varicose vein with the extremity in a dependent position is away from the heart, it is best to have the patient sit on a table with the leg suspended or, in the instance of small veins, to stand. The emptying of the veins of all blood is, in our experience, nonessential, for equally as good results occur with the veins full of blood. The basic principle of the chemical treatment is to damage the intima of the vein wall. A thrombosis then follows immediately in some small veins and up to seventy-two hours' postinjection in the larger veins. It is wise, therefore, to have the patient wear a pressure bandage for that length of time so as to keep, if possible, the vein walls

apposed. This will prevent the cording effect and lessen the surrounding tissue reaction.

The treatment is safe; the solution must be injected into and remain in the lumen of the vein; the dependent position of the extremity for injection is best; and a pressure bandage worn after injection for at least seventy-two hours is essential.

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H. O. BAMES, LOS ANGELES.—My discussion is limited to the treatment of superficial varicosities, manifesting themselves as patches of spiderweb-like reddish or purplish discolorations, frequently not sharply distinguishable from nevus vascularis.

Entering these small venules with a needle is a practical impossibility. Peri-injection is, therefore, the method of choice. Quinin urea-hydrochlorid in 5 per cent solution, used exactly as in infiltrative local anesthesia, works very satisfactorily. It is necessary to raise an intradermal wheal as well as distend the subcutaneous area. More than one treatment may be required. A not infrequent result is the enlargement of one of the constituent veins; this may then be injected by any of the methods applicable to larger veins.

Attention is drawn to a danger factor. As proof of having entered a vein we accept the fact that blood can be drawn back into the syringe. Withdrawal of blood is possible as long as the mouth of the needle, or any portion of it, lies in the lumen of the vein, though the point of the needle might have penetrated the opposite wall. The forward pressure exerted against the syringe while making the injection can easily force the bevel of the needle to follow its point and much, if not all, the solution may be distributed in the perivenous tissue.

If alcohol, sodium salicylate, or invert sugar be the injecting material in such a case, the result is merely unnecessary pain and induration for some time; if sodium chlorid is used the result is extensive necrosis and sloughing of the overlying skin; while if quinin solution is used there is no disagreeable result whatever. A proper injection may be made a few days later. Quinin is, therefore, the choice wherever the small lumen of the vein leaves the choice of injection material the least bit uncertain.

While the smaller veins are not looked upon by the profession as detrimental to health, by the laity they are considered quite disfiguring and their obliteration is demanded by them on the basis of unsightliness.

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THOMAS O. BURGER AND HALL G. HOLDER, SAN DIEGO.—Success in the injection treatment of varicose veins is dependent on (1) proper understanding of pathological physiology of the varicose state; (2) knowledge of the action of sclerosing solutions; and (3) recognition of the several contraindications to this method of treatment.

I. We have demonstrated by the intravenous use of lipiodol and sodium iodid the static or reversed circulation of blood in varicose veins with insufficiency of the valves in the saphenous vein

and perforating veins, either alone, or in combination. Actual increase in venous pressure is thus produced, ranging from 100 to 300 times normal. Associated with venous stasis there is an increased carbon dioxid content. The anoxemia, with resulting acidosis, explains the nutritional disturbances in the surrounding tissues, resulting in ulcer formation.

II. Three principal methods in treatment have been employed: (1) palliative support; (2) surgical removal; and (3) obliteration by sclerosing solutions.

Surgical removal of the affected segment has been practiced for years, but has met with numerous failures in that reformation of the varices have occurred through other anastomotic channels. Frequently the perforating veins are the source of these recurrences, as they are not amenable to surgical removal. In addition surgery represents long hospitalization, frequently worse disfigurement, and all too often increased invalidism.

The use of sclerosing solutions intravenously in varicose veins does not act to produce blood coagulation; they are in effect anti-coagulants *in vivo* as *in vitro*. There is first an irritation of the endothelium with congestion and proliferation. The fibrin of the blood is deposited on the wall of the injected vessel, adhering to the entire surface of the injured endothelium. In the third stage, sclerosis sets in involving all coats followed by atrophy. This chemical irritation of the vein, designated by Sicard as a venitis, is not to be confused in any way with the infectious process phlebitis. In phlebitis there is an inflammatory process with thrombosis, and tendency to embolism.

Trout (*Arch. Surg.*, June 1929) stated he considered the injection treatment as unsurgical, dangerous from the standpoint of embolism and altogether a "blind procedure" in spite of the many favorable reports. This unreasonable attitude cannot be justified. In cases properly selected there is abundant statistical proof that embolism practically never occurs for the two reasons indicated above, *i. e.*, (1) static or reversed circulation in varices, and (2) action of sclerosing solutions to produce a venitis or organization of the vein rather than a thrombus with tendency to embolism.

III. No patient should be treated until a complete history has been taken, physical examination, urinalysis and, in some instances, Wassermann done. All possible foci of infection should be eradicated. Careful study of the circulation of the extremity should be made, using the Trendelenburg and constriction tests. Further information as to the capillary circulation is obtained by the histamin acid phosphate intradermal wheal comparison. In the presence of thrombophlebitis, unless quiescent for one year, injection is positively unsafe. Positive contraindications are represented by foci of infection in other organs, any degree of femoral thrombosis, arterial disease of the extremity, chronic degenerative diseases, senility, and pregnancy.